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ABSTRACT

The relative effectiveness of tutoring for both partners was examined by comparing tutoring with other learning activities that differed either in the amount of exposure to the learning materials or the presence of a helping relationship or both. The subjects were 160 undergraduates who were evaluated on their acquisition of Esperanto. Subjects who were given previous exposure to Esperanto did significantly better on the final test than those without such exposure, but being a tutor was no more beneficial than studying Esperanto alone. Although tutoring was not differentially effective in terms of overall achievement, four tutoring behaviors were found to be predictive of the achievement level of the tutoring pair: (1) tutors elaborated and brought in new information; (2) tutees asked their tutors what was important for them to know and remember; (3) tutors did not ask tutees what they did not understand; and (4) tutors did not give tutees incorrect information. It is suggested that the focus of future research should be on the effectiveness of specific tutoring behaviors. (Author/JD)

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Peer Tutoring: An Evaluation of The Relative Cognitive Benefits

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Abstract

The relative effectiveness of tutoring for both partners was examined by comparing tutoring with other learning activities that differed either in the amount of exposure to the learning materials or the presence of a helping relationship or both. The subjects were 160 undergraduates who were evaluated on their acquisition of Esperanto. Subjects who had exposure to Esperanto did significantly better on the final test than those without such exposure, but being a tutor was no more beneficial than studying Esperanto alone. Although tutoring was not differentially effective in terms of overall achievement, four tutoring behaviors were found to be predictive of the achievement level of the tutoring pair. It was suggested that the focus of future research should be on the effectiveness of specific tutoring behaviors.

Peer Tutoring: An Evaluation of The Relative Cognitive Benefits

Peer tutoring has a long history in American education, dating back to the one-room schoolhouse (Allen, 1976). Common reasons for instituting a tutoring program are to raise the achievement level of the tutees and/or to improve the self-concept of the tutors. There are reports that the tutors in some programs have themselves made significant gains in achievement (e.g., Cloward, 1967). Indeed, those who have tutored, informally or as part of an established tutoring program, sometimes express the belief that they understand the content better as a result of having explained it to someone else.

A minimal requirement for claiming cognitive gains from tutoring is to compare the tutors and tutees with peers who have had equal exposure to the learning materials (Devin-Sheehan, Feldman, & Allen, 1976). Furthermore, the control group for exposure to the materials should participate in an activity that is a realistic alternative to tutoring in school settings (Allen & Feldman, 1973). For example, subjects might be given additional instruction from the teacher or might review information on their own, rather than tutor or be tutored.

When determining the relative effectiveness of tutoring for both tutors and tutees, the social aspect of this learning activity must be considered. The friendship and the helping relationships involved in tutoring have been stressed by several authors (Devin-Sheehan et al., 1976; Garbarino, 1975). Also, there has been some research on small and large

group interaction that suggests a positive relationship between a helping situation and achievement (Peterson, Janicki, & Swing, 1981).

The conceptualization of tutoring used in the current experiment included both the learning and the social aspects. Tutoring was defined as a helping relationship in which persons have exposure to the learning materials.

The first purpose of this experiment was to examine the relative effectiveness of tutoring in terms of cognitive benefits to the tutor and tutee when tutoring was compared with other learning activities that involved only exposure to the learning materials or only a helping relationship or neither. An additional purpose of this research was a preliminary examination of the specific learning behaviors individuals perform when tutoring. The information was then related to the degree of learning achieved by the tutors and tutees.

Method

Subjects

There were 160 undergraduate students in introductory psychology classes who participated in the experiment for additional course credit. The subjects were assigned to one of the two categories, either the tutor-related conditions or the tutee-related conditions. There were four conditions in each of these categories. Each condition contained 20 subjects.

Design

The four conditions in each category were distinguished by the amount of exposure that subjects had to the learning materials and by the presence or absence of a helping relationship. Thus, subjects in the four tutor-

related conditions either tutored another subject on the Experanto learning materials, studied Esperanto alone, helped another subject on an irrelevant task (proofreading for spelling errors), or did the proofreading task alone. Those in the four tutee-related conditions either were tutored on Esperanto by another subject, studied Esperanto alone, were helped by another subject on the proofreading task, or proofread alone.

Materials

Esperanto. The experimental task involved learning Esperanto, a constructed international language based on the chief European languages. Esperanto: A Complete Grammar by Ivy Kellerman Reed (1968) was the reference for all the materials involving Esperanto (i.e., video-taped lesson, quiz, study guide, test).

Proofreading task. Proofreading for spelling errors in a 1850-word biography was the irrelevant task used. The biography was an adaptation of the account of Ernest Hemingway's life as presented in Samual (1981). At approximately equal intervals throughout the passage, words were misspelled. The entire biography contained 100 misspelled words.

Procedure

All subjects were told that the experiment was intended to examine how people perform on school-related tasks.

Small groups of subjects in the tutor-related conditions began the experiment by watching the video-taped Esperanto lesson. Immediately after viewing the tape, these subjects took the 8-item quiz on Esperanto.

At this point, subjects in the tutee-related categories arrived and were assigned to work in the same room with a subject from the tutor-

related category for 15 minutes in one of four situations: (1) tutoring on Esperanto; (2) studying Esperanto individually; (3) a helping relationship focused on the proofreading task; or (4) proofreading individually.

Finally, all subjects took the 16-item test on Esperanto and completed a questionnaire about their prior foreign language instruction.

Results

Level of Performance

Separate analyses of covariance (ANCOVA) of the form, 2 (exposure to material) x 2 (help) x (2 (question format) x 2 (question application)), were performed on the test scores of those in the tutor-related conditions and those in the tutee-related conditions. The convariates for the first analysis were the number of correct items on the quiz taken after the video-taped lesson and the number of years of foreign language instruction. Only the foreign language instruction covariate was used in the analysis for the tutee-related conditions.

For the tutor-related category, the means of the test scores for the tutor, study alone, helper, and proofread alone conditions were .59, .62, .59, and .60, respectively. None of the effects involving only the between-subjects factors were significant in this ANCOVA.

In the analysis for the tutee-related category, the only significant effect involving just between-subjects factors was the main effect for exposure ($F(1, 75) = 10.61$, $p < .01$). Those subjects who were tutees or who studied alone performed at a higher level on the test ($M = .57$) than did those subjects who were helpees or who proofread for spelling errors alone ($M = .45$).

Tutor and Tutee Behaviors

The audio tapes of the tutoring sessions were evaluated for the occurrence of the instructional behaviors listed in Table 1. Each tape was divided into 20-second intervals. All behaviors occurring in an interval were recorded. The number of occurrences of each behavior during the tutoring session was divided by the total number of intervals on the tape. The mean proportions listed in Table 1 are the averages of the proportions across the 20 tapes.

In order to determine which tutor and tutee behaviors were predictive of the pair's success on the test at the end of the tutoring session, the proportions for each behavior were used as the independent variables in a stepwise multiple regression analysis. The dependent measure was the total of the tutor's and the tutee's scores on the final test. This criterion was used to represent the overall effectiveness of the tutoring session in terms of the cognitive gains of both members of the tutoring pair. The probability level for variables to be entered into the regression equation was $p < .05$ and the probability level for removal was $p < .10$.

Four variables were found to account for approximately 68% of the variance (multiple correlation squared) in the total scores of the 20 tutoring pairs ($F(4, 15) = 11.29$, $p < .01$). The standardized regression coefficients (standardized beta weights) for these variables are listed in Table 2. Clearly, there was not an exact correspondence between what tutors and tutees did most frequently and what they did that was predictive of their final performance.

Discussion

Relative Effectiveness of Tutoring

One purpose of this experiment was to examine the relative effectiveness of tutoring for producing cognitive gains of tutors and tutees. As compared with certain alternative learning activities, being a tutor was in general no better nor worse. For the tutees, participation in a tutoring session helped them to perform on the final test as well as studying alone helped their counterparts. These two activities were more beneficial than those activities that did not involve Esperanto.

There are several reasons why subjects in this experiment may not have benefited more from being in a tutoring relationship. First, tutoring may not be a beneficial or superior educational activity for learning all tasks. In contrast to evaluative reports on tutoring programs (e.g., Cloward, 1967), there have been a few well-controlled studies (e.g., Bargh & Schul, 1980, Exp. 2) comparing tutoring with studying alone that also have not found relative benefits favoring tutoring. Second, it may be that cognitive benefits to the tutor from tutoring are not obtained until the individual has tutored for several sessions. Allen and Feldman (1973) found that tutoring as compared to individual study did not result in greater cognitive gains for the tutor until the fourth session. However, these researchers did not find relative cognitive benefits for the tutee, even after five sessions.

Predictors of Successful Tutoring

In addition to examining the overall cognitive benefits of tutoring, it is important to ask what behaviors students are likely to engage in when

told to tutor or be tutored and which of these specific tutoring behaviors are most predictive of cognitive gains for the tutoring pair.

The results of this experiment support the idea that the tutor imitates to a large extent those teaching behaviors that have been modeled for that individual. The most frequent behavior used by tutors was to present the Experanto information in a manner very similar to the way it was written on the study guide. The study guide presented the information in a different order, but in the same way as the information was phrased by the instructor on the video-tape. The tutors had been requested by the instructor to repeat words, phrases, sentences, and questions after him. When put in the role of the teacher, the tutors requested this same behavior of their students. As a result, the tutees spent a greater proportion of their time in repeating Esperanto than in any other coded behavior.

The two most frequent behaviors exhibited by either the tutor or the tutee were not among the behaviors predictive of the pair's achievement, however. There were four predictive behaviors, two of which contributed positively to pair success and two which were negatively related to pair success. These findings suggest that the likelihood of cognitive gains for tutors and tutees can be increased if tutors elaborate and bring in new information; if tutees ask their tutors what is important for them to know and remember; if tutors did not ask tutees what they do not understand; and if tutors do not give tutees incorrect information. These predictive behaviors can serve as guidelines for the establishment of peer tutoring programs.

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Table 1

Occurrence of Tutor and Tutee Behaviors

Behaviors	Mean Proportion
Tutors	
Instruction	
Reading information from study guide	.626
Elaborates/brings in new information	.186
Rephrases information in own words	.062
Gives tutee incorrect information	.174
Questioning	
Asks what/if tutee doesn't understand/needs to know	.046
Quizzes tutee on information	.099
Prompts tutee	.061
Corrects tutee	.067
Makes approving comment/verbally reinforces tutee	.053
Directions	
Tells tutee to repeat words/sentences	.026
Tells tutee what to remember/what is (un)important/how to study	.050
Gives overview/explains what tutee will be doing	.037
Tells tutee to study some portion of study guide independently	.006

Table 1 (continued)

Tutees	
Questioning	
Asks what's important to know/remember	.015
Asks for clarification of information	.068
Responding	
Says words/sentences at tutor's request	.343
Makes spontaneous comment relevant to task	.035
Other Behaviors--Either Subject	
Silence entire 20-second interval	.058
Comments extraneous to task	.080
Unintelligible speech	.030

Note. The values represent the mean proportion of intervals per session in which the behavior occurred.

Table 2

Behaviors Predictive of Successful Tutoring

Behaviors[a]	Standardized Regression Coefficients[b]
Tutor elaborates/brings in new information	.565
Tutee asks what's important to know/remember	.553
Tutor gives tutee incorrect information	-.457
Tutor asks what/if tutee doesn't understand/needs to know	-.333

[a] Behaviors are listed in the order in which they were entered into the stepwise regression equation.

[b] Beta weights in stepwise multiple regression in which dependent measure was total score achieved by tutor and tutee in each pair.